THE CRANE CORNER

NAVAL FACILITIES ENGINEERING COMMAND

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A WORD FROM TOPSIDE

Sam Bevins

In our continuing effort to eliminate crane accidents by raising the level of safety awareness among personnel involved in weight handling operations, we have produced a video, "Weight Handling Program for Commanding Officers," that provides an executive summary of the salient program requirements and critical command responsibilities associated with shore activity weight handling programs. The video covers NAVFAC P-307 requirements and activity responsibilities.

We have prepared a written summary to accompany the video. The video and summary have been distributed to naval activities with weight handling programs. Additional copies of the video and accompanying summary are available through the Defense Automated Visual Information System/ Defense Instructional Technology Information System at http://dodimagery.afis.osd.mil/. The product identification number (PIN) is 806467.

SELECTED EXERPTS FROM
***"WEIGHT HANDLING PROGRAM FOR COMMANDING OFFICERS"* VIDEO**

Commanding Officer Responsibilities

As a commanding officer of a shore based activity, you are responsible for all weight handling operations within your command. What do these responsibilities entail?

Command Written Procedures

You need to develop and maintain an effective weight handling program in accordance with the policies and directives issued by the Navy Crane Center. This means your command should have written procedures for management of the program, identifying who is responsible for which parts of the program. Among other things, these procedures should outline how to properly maintain equipment and train weight handling personnel, and how to comply with all weight handling program documentation and reporting requirements including Crane Safety Advisories and Equipment Deficiency Memorandums.

NAVFAC P-307, Management of Weight Handling Equipment, prescribes the requirements for ensuring safe and efficient weight handling equipment management and operations. It provides the administrative and technical criteria for maintenance, inspection, testing and certification of cranes, the alteration of cranes, the licensing procedures for crane operators, and the training of all other personnel, the safe operation of cranes and the documentation requirements. Essentially the four critical elements of the Navy's Crane program are: equipment condition, safe operation, training, and documentation. Weight handling equipment consists of cranes, rigging gear, and associated equipment.

NAVFAC P-307

- Maintenance
- Inspection
- Testing
- Certification
- Crane Alterations
- Licensing of Operators
- Training of Crane Program Personnel
- Operation Safety
- Equipment History Files

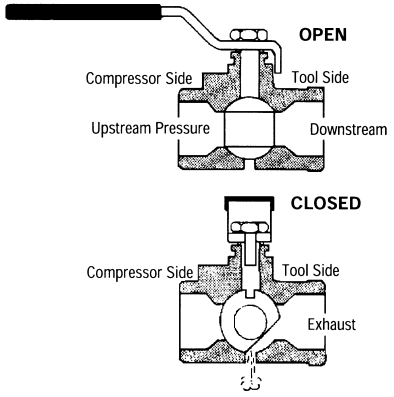
Safe and Reliable Weight Handling

Shore activities rely on safe weight handling every day to service ships and their facilities. Crane accidents can have severe consequences on personnel, on equipment, and on the Navy's mission. Your goal is to ensure that all cranes, Navy-owned and contractor-owned, operating at your activity, are held to applicable standards. You must focus the appropriate attention and provide the required resources to achieve a fully compliant weight handling program. Reducing the accident rate to zero must remain a strong command focus.

The Navy Crane Center is a resource for you. Our mission is "safe and reliable weight handling programs" throughout the Navy. For more information, please visit us on the web at http://ncc.navfac.navy.mil.

HAVE YOU HEARD ABOUT?

A ball valve with a safety exhaust port is available for compressed air systems. When this type of valve is closed, the downstream side of the valve is vented providing continuous air pressure relief. This valve is ideal for protection of personnel and/or components downstream. The valve is intended for low-pressure applications and is available in a wide range of sizes, materials, and configurations such as single or three-piece body styles. Additional features include a muffler or silencer on the exhaust port and a handle locking capability to lock the valve in either the open or closed position. A typical application where this valve has been used in the Navy crane community is the portal crane diesel generator air start system.



FIRST QUARTER FY01
CRANE ACCIDENT REPORT

The Navy Crane Center (NCC) disseminates crane accident lessons learned to prevent repeat accidents and improve overall crane safety. NAVFAC P-307 requires commands to submit a final, complete accident report (including corrective/preventive actions) to NCC within 30 days regardless of severity or type. In addition, contracting officers are required to forward reports of contractor crane accidents involving fatalities, in-patient hospitalization, overturned cranes, collapsed booms, or other major crane or property damage to NCC within 30 days. In the first quarter of FY01, Navy shore activities reported 42 crane accidents. Serious accidents included two personal injuries, three dropped loads, three overloads, and four two-blockings.

PERSONAL INJURIES

Accident: While removing a rigging attachment from a portal crane, a rigger suffered a fractured thumb when his hand became lodged between the padeye and the load.
Lesson Learned: When removing rigging gear, riggers should always be mindful of potential hazards (e.g., pinch points).

Accident: While trying to maneuver a suspended load, a rigger mistakenly placed his hand between the load and the building structure. The load became stuck momentarily. When the load became free, it struck the rigger causing an injury to his finger.
Lesson Learned: When maneuvering suspended loads, riggers should always check clearances and be mindful of potential hazards (e.g., pinch points).

DROPPED LOADS

Accident: A floating crane was being used to install a sliding padeye on a ship. This operation required that the main and whip hoist be used simultaneously. The crane raised the padeye vertically using the main hoist. As the whip raised the lower end (at about a 45-degree angle), the rigging gear on the lower end slipped. This allowed the padeye to drop approximately two feet to the deck. The rigger in charge did not follow the lifting plan instructions that recommended a different rigging configuration.
Lesson Learned: Prior to any hoisting operation, the crane team shall verify that the load is properly secured. Lifting plans must be followed. If there are questions concerning the lifting plan, contact the supervisor for clarification.

Accident: A portal crane was lifting a manlift weighing 23,000 pounds when the load shifted. This caused the counterweight of the manlift to contact the ground. The load was improperly secured and the crane's hook was not centered over the load's center of gravity prior to the lift. A pre-lift brief was not conducted.
Lesson Learned: Prior to any lift, rigging personnel shall verify that all lifting attachments are secure and that the lifting hook is located over the load's center of gravity. Conduct a pre-lift brief before lifting complex geometric shapes.

Accident: A mobile crane was being used to load test a synthetic sling. This test was conducted because the sling was used in salt water and its reliability was in question. When the test load of approximately 28,000 pounds was lifted, the sling broke causing the test load to drop.
Lesson Learned: Since this sling was used in salt water and its reliability was in question, the sling should have been discarded.

OVERLOADS

Accident: A mobile crane with a lifting capacity of 19,200 pounds was overloaded when it lifted a sand hopper that was stenciled with the improper full weight capacity. The full weight of the sand hopper was marked as 16,000 pounds, but the actual full weight was 23,850 pounds.
Lesson Learned: Weight handling equipment managers shall ensure that containers are accurately marked with the full weight appropriate to the container's purpose. Additional markings may be necessary to indicate the type of material to be placed in the container. (See *P-307 Questions & Interpretations, Marking of Sand Hoppers, Tubs, and Other Large Containers* . . . on Page 8.)

Accident: A mobile crane was overloaded when it was used to place a 50,000-pound shipping container on a concrete pad. As the boom was being lowered, the rigger in charge ordered the operator to bypass two warning alarms and the 100 percent load limit switch to reach the concrete pad. As the suspended load was being "pushed" by the riggers, the crane tipped.
Lesson Learned: This operation highlights a number of safe operating practice violations. A "dry run" should have been performed with an empty hook to establish the maximum radius of the lift to compare with the crane's load chart. The crane should have been re-positioned accordingly. The operator should have refused to bypass a crane's 100 percent load limit and should have stopped the lift. Pushing a suspended load "the last few inches" is an unsafe practice. The consequences of this accident were minor but could have been catastrophic. Prudent application of operational risk management would have prevented this accident.

Accident: A tie-down sling on a floating crane was overloaded to failure when the operator did not see the rigger in charge giving him the signal to boom down. The operator continued to apply tension to the sling by hoisting up, causing the wire rope sling to part.
Lesson Learned: Operators shall always maintain communication (radio or sight) with the rigger in charge. When communication is lost for any reason, stop hoisting operations until proper communication is re-established.

TWO-BLOCKINGS

Accident: While preparing for travel after a hoisting operation, an operator two-blocked a mobile crane. The operator needed to use the by-pass key to raise the whip hook. While conducting the operation, the operator failed to stop the hook prior to its contacting the sheave guard. This contact caused the sheave guard welds to break.
Lesson Learned: The operator should not lose sight of the hook when raising it near its two-block limit. If visibility is obstructed, riggers should provide assistance and the hook should be raised at the slowest possible speed.

Accident: While conducting an operational test as part of the annual certification, an operator two-blocked a mobile crane. During the test, the operator failed to stop the hoist prior to contacting the upper limit switch. The hoist momentum caused the hook to two-block.
Lesson Learned: Crane operators should test the upper limit switch at the lowest speed (first point). Stop the block prior to contacting the limit switch. Then, hoist the block slowly into the limit switch.

Accident: While relocating a main feed pump tube oil cooler (weighing approximately 200 pounds), an operator two-blocked a jib crane. During the lift, the operator attempted to stop the hoisting operation by releasing the pendant controls. The malfunction of the pendant controls caused the two-blocking.

Accident: A mobile crane was two-blocked when an unauthorized operator operated the crane. The two-blocking caused the sheave keeper pin to bend.

Serious crane accidents are still occurring and human error (e.g., inattention to detail) is the primary factor. Weight handling program managers and safety officials are encouraged to consider the potential risk of accidents similar to those highlighted above occurring at your activity and apply the lessons learned to prevent similar accidents. OPNAVINST 3500.39, *Operational Risk Management*, prescribes methods for assessing hazards and controlling and minimizing risks in hazardous operations. Activities should incorporate these principles into both training and day-to-day weight handling operations.

Contracting officers are again reminded to ensure that contractors report all serious weight handling equipment accidents that occur on Navy property per paragraph 1.7.2 of NAVFAC P-307.

CRANE SAFETY ADVISORIES, EQUIPMENT DEFICIENCY MEMORANDA, AND LESSONS LEARNED

We receive reports of equipment deficiencies, component failures, crane accidents, and other potentially unsafe conditions and practices. When applicable to other activities, we issue a Crane Safety Advisory (CSA), an Equipment Deficiency Memorandum (EDM), or a "lessons learned" message. A CSA is a directive and often requires feedback from the activities receiving the advisory. An EDM is provided for information and can include deficiencies to non-load bearing or non-load controlling parts. CSA's, EDM's, and lessons learned of general interest are summarized in *The Crane Corner*.

CRANE SAFETY ADVISORY

CSA-98: Operation of Mobile Cranes Mounted on Barges. A crane accident occurred at a private shipyard when a commercially operated 250-ton crane mounted on a barge overturned into the water. The cause of the accident is not yet known.

The use of mobile cranes on barges presents unique hazards. Special consideration must be given to barge stability, crane manufacturer's loading limitations, barge surface conditions, movement limitations for set up, tie-down requirements when making any lifts, and operational restrictions due to weather and/or wave conditions. NAVFAC P-307, paragraphs 3.7.3 and 10.18, provide the minimum requirements for set-up, testing, certification, and operation of a mobile crane temporarily mounted on a barge. Strict adherence to these requirements is essential.

MOBILE CRANE ACCIDENT LESSON LEARNED

Brake/Clutch Effectiveness in Wet Conditions. A recent potentially serious accident occurred with a Linkbelt model HC-138A crane. The crane operator hoisted the load just high enough to clear a skid, raised the boom slightly, and then returned the boom hoist controller to the neutral position. As the operator was rotating the crane, the boom hoist brake slipped and the boom started to lower. The operator then attempted to raise the boom, however the boom slipped through the clutch and the boom continued to lower until the load rested on the ocean floor.

There were multiple failures that resulted in this accident. Both the boom hoist brake and the boom hoist clutch failed. There was considerable rain that day and there were leaks in the machinery house roof that permitted water to penetrate the brakes and clutches. The crane team and the activity were not sufficiently sensitive to these conditions. Wet conditions call for increased awareness of brake and clutch capabilities.

In addition, the operator did not follow the OEM operator's manual procedures that state, "Keep boom hoist pawl engaged at all times except when lowering the boom. This device is a reserve safety feature to cover possibility of loss of hoist brake or clutch action." NAVFAC P-307 states, "Crane operators shall read,

thoroughly understand, and comply with all procedures, safety instructions, and precautions in the OEM's operation manual." The activity included the OEM's requirement in a standard operating procedure, however the operator was not present at the briefing that discussed this procedure. There were no signs in the operator's cab alerting the operator to the necessity of keeping the boom pawl engaged.

Finally, activities need to be sensitive to apparently minor deficiencies such as the leaky machinery house roof. Inspectors and maintenance personnel need to be alert to potential water intrusion into load bearing and load controlling components and safety devices and make repairs expeditiously.

Activity weight handling managers shall share the details of this accident and lessons learned with activity weight handling personnel. ■

P-307 QUESTIONS & INTERPRETATIONS

Question: Pre-Use Check – Tagged Deficiency. NAVFAC P-307, paragraph 9.3.1, requires the crane operator, during the pre-use check of the crane, to secure the crane from operation and notify the supervisor if a deficient condition to an asterisked item [on the Crane Operator's Daily Check List (ODCL), NAVFAC P-307, figure 9-1] is observed. What if the deficiency is a known condition that is tagged (e.g., whip hoist is inoperative)?

Answer: In the case of a known (and tagged) deficiency, the operator should mark the appropriate block on the ODCL (e.g., "Operation" for an out of service hoist) as unsatisfactory and explain in the remarks block that the crane has been determined satisfactory for operation with the restrictions noted. In such cases, the operator would not need to contact his supervisor.

Question: Radius Required for Static Test and Boom Operation Test on Mobile Cranes. Clarify the term "minimum radius" used in paragraph 5.5.1.d of P-307 appendix E. Does it imply the minimum possible radius used?

Answer: The term minimum radius means the maximum load at the minimum radius that can be achieved. If the size of test weights does not allow the test director to bring the weights into the load chart's specified minimum radius, then the crane may be tested at the closest radius that allows safe conduct of the test. Following the manufacturer's load chart, use the maximum load at the achievable radius. For example, if a crane has a maximum capacity of 140,000 pounds at a radius of 10 feet, but, due to the size of the test weights, the crane can only be tested at a minimum radius of 11 feet 6 inches where the rated capacity is 111,000 pounds, then the test load should be 110 percent of 111,000 pounds at a radius of 11 feet 6 inches. The crane would then have a certified capacity of 111,000 pounds at a radius of 10 feet. This difference between the OEM rated capacity and certified capacity should be explained in the "Remarks" block of the certification form. This "restricted" minimum radius (in the example 11 feet 6 inches) becomes the minimum to test the crane in P-307, appendix E, paragraph 5.5.1.d.

Question: Definition of Portable Chainfalls and Hoists. What is the definition of portable chainfalls and hoists identified in paragraph 1.3.1 of the September 2000 version of NAVFAC P-307?

Answer: NAVFAC P-307, paragraph 1.3.1, states, "Category 2 and 3 cranes (Cranes with rated capacities of 20,000 pounds or greater are category 2. Cranes with rated capacities less than 20,000 pounds are category 3.)

Overhead traveling cranes
Gantry cranes (rail mounted)
Wall cranes
Jib cranes
Pillar cranes
Pillar jib cranes
Monorails and associated hoists
Fixed overhead hoists, including chainfalls (portable chainfalls and hoists are covered in section 14)
Pedestal mounted commercial boom assemblies (fixed length, telescoping, and articulating types) attached to stake trucks, trailers, flatbeds, or railcars, or stationary mounted to piers, etc., with OEM rated capacities less than 2,000 pounds."

The above paragraph was revised to clarify fixed overhead hoists and to note that all portable hoists are covered in section 14.

Portable chainfalls and hoists are identified as having upper mounting hooks that allow removal of the chainfall or hoist from its overhead trolley or fixed mounting fixture without disassembly of load bearing parts or components. Designation for use at the same location on a continuing basis is no longer a criteria for determining portability. (See note below.) Also, the method of power connection (air or electrical) is not an issue. Although disconnect means such as electrical plugs and quick-disconnect air connections are preferable, they are not mandatory to meet the definition of portability. It should be noted that the activity may continue to designate such equipment as category 3 cranes. Before making the determination, evaluate the differences between the maintenance/test requirements of a section 14 chainfall or hoist versus a category 3 crane. For example, the hooks of a section 14 chainfall or hoist do not require NDT. However, section 14 chainfalls and hoists must be tested annually (i.e., within 12 months prior to use per paragraph 14.4.1) instead of biennially as allowed for most category 3 cranes (paragraph 3.4.1). In any case, the activity must clearly identify each chainfall or hoist as being a section 14 portable unit or a category 3 crane and adhere to the appropriate requirements.

Note: NAVFAC P-307, paragraph 1.3.2, contradicts this statement and indicates that chainfalls designated for use at the same location on a continuing basis are not considered portable. This is an error that will be corrected in the next revision to NAVFAC P-307.

Two additional items that must be addressed are training and testing of supporting structures.

TRAINING

The use of portable chainfalls and hoists on crane structures (jibs, bridges, monorails, etc., as identified in section 14) requires qualification as a category 3 crane operator. (See section 13 for training requirements.) The use of portable chainfalls, hoists, and other rigging gear attached to non-crane structures requires rigger training as identified in section 13.

SUPPORTING STRUCTURES

NAVFAC P-307 "14.1.1 Covered Equipment. This section applies to the following equipment used in weight handling operations: rigging gear (slings, including chain, wire rope, metal mesh, synthetic rope, synthetic webbing, and synthetic roundslings; shackles; eye bolts; swivel hoist rings; links and rings; turnbuckles; etc.); portable load indicators (dynamometers, load cells, crane scales, etc.); and portable chainfalls and hoists." Also included are crane structures, which are defined as jib cranes, bridge cranes, monorails, and davits that do not have permanently mounted hoists.

NAVFAC P-307 "14.4.1 Load Test. Manual and powered chain hoists, portable A-frames, portable floor cranes, portable gantries, magnetic and vacuum lifting devices, personnel platforms, and cranes and hoists integral to larger machine systems shall be load tested annually (i.e., within 12 months prior to use). Crane structures (as defined in paragraph 14.1.1) shall be load tested biennially (i.e., within 24 months prior to use)."

As noted above, portable hoists are to be tested annually and crane structures are to be tested biennially. However, if a portable hoist is tested with a crane structure of the same capacity (overload of the hoist also overloads the crane structure), the test date of the crane structure shall be that of the hoist. This will usually be the case when a portable hoist is permanently assigned to a crane structure. If a crane structure is used to test multiple portable hoists throughout the year, the crane structure capacity must be greater than the highest test load to prevent continuous overloading of the crane structure.

Question: Component Failures as Accidents. What is the intent and/or the limitations of the statement in P-307 paragraph 12.3, "A component failure (e.g., motor burnout, gear tooth failure) is not considered an accident solely due to material or equipment damage unless the component failure results in damage to other components (e.g., dropped boom, dropped load, roll over, etc.)"? This statement has been used in the following events to conclude that they were not reportable WHE accidents:

A bridge crane's auxiliary hoist drive shaft failed in fatigue while a load was suspended. Upon hearing the noise, the operator immediately stopped the crane by applying the brake (which was downstream from the broken shaft). The operator then lowered the load to the ground through release/application of the brake.

A screw holding down a deck plate on a mobile crane worked loose allowing the plate to rise up. As the crane was being rotated, the spud lock housing contacted the plate causing slight damage to the plate.

While lowering a boom on a portal crane, the boom dog unexpectedly engaged the drum ratchet. The impact caused the failure of hold-down bolts at the opposite end of the drum, but the drum pawl and the pinion gearing prevented a catastrophic free-fall of the boom.

Answer: Although the statement is open to interpretation, the intent of this statement is to cover components that fail to operate or perform properly where there is no damage to other components as a result. That is, the damage is confined to the component that failed. Examples are: a travel brake that fails to open during travel causing damage to the brake; a motor burn out that merely results in setting the brakes and stopping the load movement; and a gearbox that is discovered to have damaged internal components but where there is no consequent damage to other components outside of the gearbox. Although the examples of consequences noted in the statement are catastrophic, the amount of consequent damage is irrelevant for reporting purposes.

In the first case noted in your question, the "component failure" exception would apply if there were, in fact, no uncontrolled lowering (i.e., dropping) of the load as a result of the broken shaft. The second case should be treated as a reportable WHE accident. The screw worked loose (i.e., failed to perform correctly) which resulted in consequent damage to the deck plate. The third case should also be treated as a reportable WHE accident. The unexpected setting of the boom pawl (either through failure of a control component or inadvertent setting by the operator or inspector) resulted in consequential damage to other components (i.e., the drum bearing bolts).

Question: Definition of Category 4 Cranes. In the past, pedestal-mounted cranes were categorized as category 3 cranes with de-rated capacities of 1,000 pounds. We trained the operators of these cranes as category 3 crane operators. Our pedestal-mounted cranes on the back of our trucks have a rated capacity of 2,000 pounds. That puts them in a category 4 status and requires a different license to operate. It is not feasible to qualify the

number of operators of this equipment as category 4 crane operators. We believe that the NAVFAC P-307 does not allow de-rating of the hoist.

It will not benefit our command to remove all these hoists and replace them with lower capacity hoists. We propose that these hoists be configured with two parts of line that can be reconfigured to single part lines under the guidance of the manufacturer. They could then be considered category 3 cranes with rated capacities of 1,000 pounds.

Answer: These cranes may be administratively downgraded to a capacity below 2,000 pounds. They will then be category 3 cranes and may be operated by properly trained category 3 operators. The intent of NAVFAC P-307, paragraph 1.3.1, regarding category 4 cranes is to not allow commercial truck-mounted cranes (covered by ANSI B30.5) or articulating boom cranes (covered by ANSI B30.22) to be operated by a category 3 operator. A properly licensed operator must operate these two types of category 4 cranes regardless of capacity. Pedestal-mounted commercial boom assemblies may be down-rated to a capacity below 2,000 pounds to allow operation by a category 3 operator.

Question: Marking of Sand Hoppers, Tubs, and Other Large Containers with Empty and Full Weights. NAVFAC P-307, Paragraph 10.5.1, requires that sand hoppers, tubs, and other large containers be marked with empty and full weights. Request revision to this paragraph as follows: "Sand hoppers, tubs, and other large containers that may contain material shall be marked with empty and full weights, or alternatively with the empty weight and safe working load."

We currently have containers (tubs) for general use with various types of material, which may weigh considerably different weights depending on the density of the material that is placed in the tub. Some tubs, by their inherent design, are not capable of supporting a full load of certain materials. As an example, we have several "trash tubs," approximately 4 feet wide, 5 feet deep, and 4 feet high, with a safe working load (SWL) of 1 ton. This working load is adequate for transporting low-density trade litter and trash, however, if this tub were completely full of spent sandblast grit, the weight would be approximately 25 tons. It is impractical to design this type of general use tub for a full load of 25 tons. We believe it is impossible to mark a tub for its full weight unless it's use is limited to one type of material or the tub is over designed for the heaviest possible material to be placed in it.

By marking the container with the empty weight and SWL, the gross weight can be determined by adding the two together without the need to limit its use to one specific type of material.

Answer: Navy Crane Center approves the marking of the SWL on tubs utilized for trash or scrap. The top of the tub must be open or accessible to allow the rigger in charge to determine the type and weight of the material placed in the tub. The lifting of all other containers shall meet the requirements of paragraph 10.5.1. Containers where the weight can not be determined by visual inspection or verified by a load indicating device shall be considered full and the requirements of paragraph 10.5.1 apply.

Question: Written Procedures for Complex Lifts. Clarify the requirement for written procedures for complex lifts as noted in NAVFAC P-307, paragraph 10.4.1.1. What should be addressed in a written complex lift procedure?

Answer: The procedures required vary with the actual complexity of the lift. Complex lifts as defined by NAVFAC P-307, paragraph 10.4.1, are lifts that involve a moderate to high level of risk. Each activity should develop a complex lift procedures checklist. From the list, choose the items that are applicable to the lift and develop the lift procedure as necessary.

Written procedures for performing complex lifts may address the following information and parameters:

· The weight of the object to be lifted.
· Special precautions for unusual shapes.
· The capacity of the crane and the hook(s) to be used. If a variable capacity crane is utilized, confirm capacity at the boom radius to be used.
· For lifts requiring two or more cranes, determine the maximum capacity for each crane and percentage of weight each crane will lift. Address coordination of lifts and communication.
· List of the rigging equipment to be used.
· The need for a portable load indicating device.
· The need for a sketch or drawing showing rigging gear configuration, capacities, and orientation with regard to the object to be lifted.
· Crane team personnel required and their responsibilities.
· Special prerequisites and precautions prior to and during the lift (e.g., half-full tanks, residual water in bilges or structure, pressure equalization prior to taking a strain, submerged objects, weather condition limitations).
· The type of communication to be employed.
· Stop points (e.g., in the event of lifting submerged material to inspect exposed rigging gear or integral attachments, allow drainage).
· The maximum allowable load, as shown on a load indicator, prior to stopping for further technical resolution (e.g., contacting the cognizant technical code or original equipment manufacturer (OEM)).
· The lift/crane path (to calculate counter weight and travel clearance).
· Technical manuals excerpts or other OEM materials pertinent to object being lifted, (e.g., HAZMAT instructions, shipboard or facility plant equipment manuals, radiological manuals).
· A remarks or notes block for special situations where instructions can be added to the complex lift procedure.

AGING BRIDGE CRANES - ALTERNATIVES

It is important for naval shore activities to review the condition and age of their bridge cranes and make provisions for overhaul or replacement as part of their capital investment plan, strategic plan, or long range maintenance plan. In most cases, bridge cranes are class 3 property and are overlooked as part of an activity's equipment replacement plan. It is the responsibility of the activity's weight handling program manager to ensure that equipment is safe and supports production.

As cranes age, the availability of replacement parts becomes scarce and the costs of operation, maintenance, and repair increase. Replacement or overhaul costs need to be weighed against annual maintenance costs, the equipment's present safety and reliability, the frequency of breakdowns and associated recertification costs and lost production time, and parts availability. If reliability is a problem, the costs for inspection and selective re-certification escalate. When considering replacement or overhaul, take into account the extent of repairs and the cost of obtaining alternate equipment during the overhaul period. In some cases, "overhaul by replacement" may be the most cost effective option.

The Navy Crane Center recognized the need for an acquisition strategy to allow field activities to more cost-effectively acquire replacement cranes. Accordingly, two indefinite delivery indefinite quantity contracts (IDIQ), one for specialized cranes and one for standard commercial cranes have been awarded. These contracts streamline the acquisition process for new or replacement bridge cranes. For information on these contracts, contact Margaret Gettings or Gerald Clark, phone (610) 595-0505 or DSN 443-0505.

BRAKE MANUAL RELEASE MECHANISMS

Imagine a portal crane operator's surprise during a routine operational check of the whip hoist when he notices the hook block continues to drift downward after the hoist controller is returned to the neutral position. Or the OET operator's surprise when he turns to attach a load to the crane hook and notices the hook block is on the ground after he just positioned the crane and hook block for the impending lift. Unfortunately, both of these scenarios and a few other related incidents have been reported to NCC where it was determined that the brake manual release mechanism was not properly positioned after performing routine maintenance. In the case of the OET crane, the release lever was not fully thrown and crane vibration and brake operation eventually caused the release mechanism handle to fall back into the brake released position.

Most manufacturers of shoe and disc brakes offer, either as standard equipment or as an option, a manual brake release mechanism. This type of release may also be referred to as a quick release mechanism. The use of a manual release mechanism eliminates the need to manually hold the brake open (with a wedge, screwdriver, etc.) while testing a second brake or performing some other planned action on the brake.

NAVFAC P-307 Section 9, Operator Checks, requires the operator, to check those brakes equipped with manual release mechanisms to ensure the mechanism is not in the brake released position (paragraph 9.1.2.1.2-h). It should be noted that these checks can only be performed where there is suitable access for the operator. The crane operator must also be trained to identify the proper position of the release mechanism. Many brake manufacturers do not provide an indicator to readily identify the release/setting positions.

Some activities have taken steps to "lockout" the brake release feature by removing the brake release lever/handle when not in use or installing a bolt through the lever/handle shaft to prevent rotation. However, maintenance personnel, inspection personnel, and crane operators need to be aware of the proper operation and setting of brake manual release mechanisms to avoid unnecessary surprises that could have been easily avoided.